

# Population health profile of the Bendigo and District Division of General Practice

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The data in this report are designed to be used for needs assessment and planning purposes: while they are based on the best available data and analytic processes, data available by postcode or Statistical Local Area, as used in this report, cannot be precisely translated to Division. Division totals in the report should, therefore, be seen as estimates. Interpretation of differences between data in this profile and similar data from other sources needs to be undertaken with care as such differences may be due to the use of different methodology to produce the data.

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# Population health profile of the *Bendigo and District Division of General Practice*

## Introduction

This profile has been designed to provide a description of the population of the Bendigo and District Division of General Practice, and aspects of their health. Its purpose is to provide information to support a population health approach, which aims to improve the health of the entire population and to reduce health inequalities among population groups: a more detailed discussion of a population health approach is provided in the supporting information, page 17.

## Contents

The profile includes a number of tables, maps and graphs to profile population health in the Division and provides comparisons with other areas (eg. country Victoria and Australia). Specific topics covered include:

- a socio-demographic profile (pages 2-6);
- GP workforce data (page 7);
- immunisation rates (page 7);
- rates of premature death (page 8); and
- estimates of the prevalence of chronic disease and selected risk factors (pages 9-13).

## Key indicators

<b>Location:</b>	Victoria	
<b>Division number:</b>	326	
<b>Population‡:</b>	<b>No.</b>	<b>%</b>
Total	102,442	
65+	15,277	14.9%
<25	35,203	34.4%
Indigenous	964	1.0%
<b>Disadvantage score<sup>1</sup>:</b>	989	
<b>GP services per head of population:</b>		
Division‡	3.7	
Australia	4.7	
<b>Population per FTE GP:</b>		
Division‡	1,613	
Australia	1,403	
<b>Premature death rate<sup>2</sup>:</b>		
Division‡	321.1	
Australia	290.4	

<sup>1</sup> Numbers below 1000 (the index score for Australia) indicate the Division is relatively disadvantaged

<sup>2</sup> Deaths at ages 0 to 74 years per 100,000 population

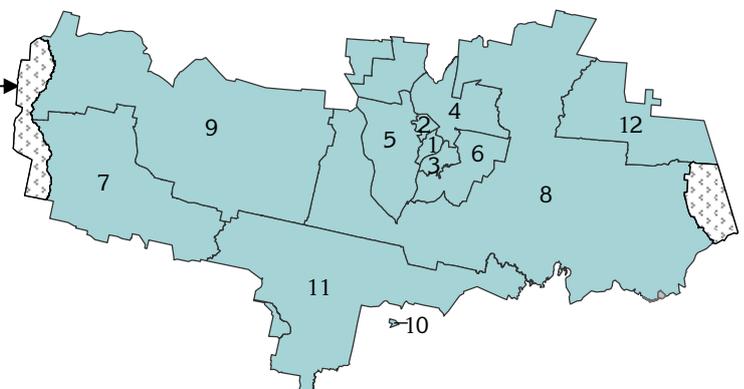
‡ See note "Data converters and mapping" re calculation of Division Total

## Bendigo and District Division of General Practice

*Victorian Divisions of General Practice*



*Bendigo and District DGP by SLA*



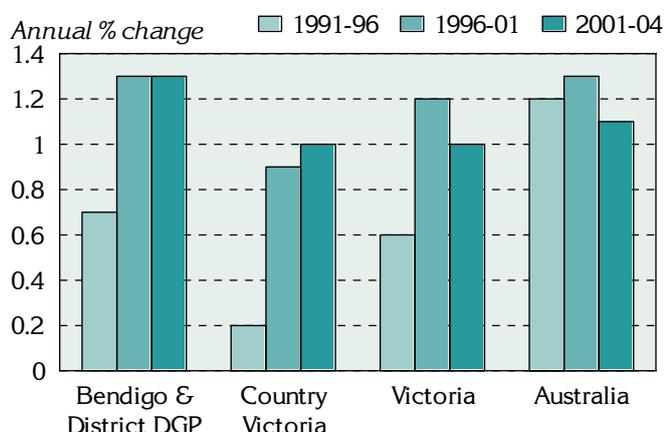
\* Map legend: see page 6

# Socio-demographic profile

## Population

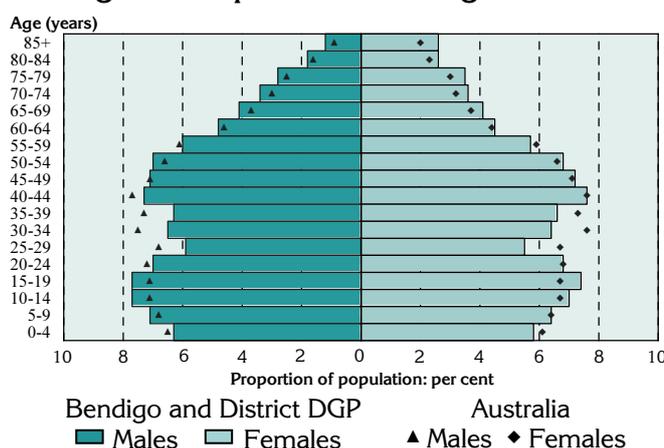
The Bendigo and District Division had an Estimated Resident Population of 102,442 at 30 June 2004.

**Figure 1: Annual population change, Bendigo and District DGP‡, country Victoria<sup>1</sup>, Victoria, and Australia, 1991 to 1996, 1996 to 2001 and 2001 to 2004**



Over the five years from 1991 to 1996, the Division's population increased by 0.7% on average each year, higher than for country Victoria (0.2%) and Victoria (0.6%) and Australia as a whole (1.2%). From 1996 to 2001, the annual percentage increase in the Division (1.3%) was higher than for country Victoria (0.9%) and Victoria (0.6%). The same growth rate of 1.3% per year from 2001 to 2004 was greater than the annual increases for country Victoria and Victoria (1.0%), and Australia (1.1%).

**Figure 2: Population in Bendigo and District DGP‡ and Australia, by age and sex, 2004**



The age distribution of the Division's population is similar to that for Australia. The most notable differences are:

- at younger ages – a marginally smaller proportion of children aged 0 to 4 years, and a higher proportions of young people aged 15 to 19 years;
- from 25 to 39 years – lower proportions of both males and females; and
- at older ages – slightly higher proportions of both males and females aged 65 years and over.

**Table 1: Population by age, Bendigo and District DGP‡ and Australia, 2004**

Age group (years)	Bendigo and District DGP		Australia	
	No.	%	No.	%
0-14	20,651	20.2	3,978,751	19.8
15-24	14,552	14.2	2,762,769	13.8
25-44	26,726	26.1	5,881,048	29.3
45-64	25,236	24.6	4,864,037	24.2
65-74	7,820	7.6	1,374,792	6.8
75-84	5,498	5.4	934,505	4.7
85+	1,959	1.9	295,602	1.5
<b>Total</b>	<b>102,442</b>	<b>100.0</b>	<b>20,091,504</b>	<b>100.0</b>

As shown in the age-sex pyramid above, the Bendigo and District DGP had more children aged 0 to 14 (20.2%) and young people aged 15 to 24 (14.2%), but fewer people aged 25 to 44 years (26.1%) than Australia as a whole (with 19.8%, 13.8% and 29.3%) (Table 1). The Division had slightly higher proportions of the population aged 65 years and over compared to Australia.

The Bendigo and District DGP comprised 2.1% of people born in predominantly non-English speaking countries and resident in Australia for five years or more (Table 2), half the level in country Victoria (4.4%). Recent arrivals (those resident in Australia for less than five years) from non-English speaking countries comprised 0.3% of the Division's population (compared to 0.4% in country Victoria).

<sup>1</sup>References to 'country Victoria' relate to Victoria excluding the Melbourne Statistical Division.

‡ See note under 'Data converters and mapping' re calculation of Division totals on this page

Of these residents, 0.2% had poor proficiency in English (determined when people aged five years and over born overseas in predominantly non-English speaking countries reported in the Census speaking another language and speaking English 'not well' or 'not at all'), lower than country Victoria (0.6%), Victoria (3.4%) and Australia (2.4%).

**Table 2: Non-English speaking born, Bendigo and District DGP, country Victoria and Australia, 2001**

People born in predominantly non-English speaking countries	Bendigo and District DGP		Country Victoria		Victoria		Australia	
	No.	%	No.	%	No.	%	No.	%
Resident in Australia for five years or more	1,974	2.1	56,852	4.4	644,806	13.8	2,019,410	10.8
Resident in Australia for less than five years	331	0.3	5,810	0.4	110,557	2.4	408,074	2.2
Poor proficiency in English <sup>1</sup>	139	0.2	7,285	0.6	147,394	3.4	425,399	2.4

<sup>1</sup> Calculated on persons aged 5 years and over who reported speaking another language and speaking English 'not well' or 'not at all'

### Major non-English speaking birthplaces, Bendigo and District DGP, 2001

Australian-born people comprised 93.8% of the Division's population, notably higher than the Australian figure of 72.6%. Of the 3.6% of people from English speaking countries, 2.7% were from the UK and Eire. The major birthplaces of the non-English speaking population include Germany and The Netherlands (both 0.3%); and Italy and the Philippines (both 0.2%); all other birthplaces of non-English speaking populations represented 0.1% or less of the Division's population.

## Socioeconomic status

*The indicators presented in this section describe geographic variations in the distribution of the population for a number of key socioeconomic influences, which impact on the health and wellbeing of populations.*

The Bendigo and District DGP had a higher proportion of single parent families (13.3%) compared to country Victoria as a whole (10.7%), while the proportion of Aboriginal and Torres Strait Islanders (1.0%) was similar (1.1% in country Victoria) (Figure 3, Table 3).

Full-time secondary school education participation of 16 year olds living in the Division (77.0%) was below that for country Victoria (81.2%).

A higher proportion of the Division's households received rent assistance from Centrelink (16.3%) compared to country Victoria and Victoria (both 12.9%), and there were more dwellings rented from the State housing authority (4.1%, compared to 3.9% and 3.2%). The proportion of dwellings with no access to a motor vehicle (8.7%) was slightly higher than that for country Victoria (7.7%), but lower than the rate for Victoria (9.0%).

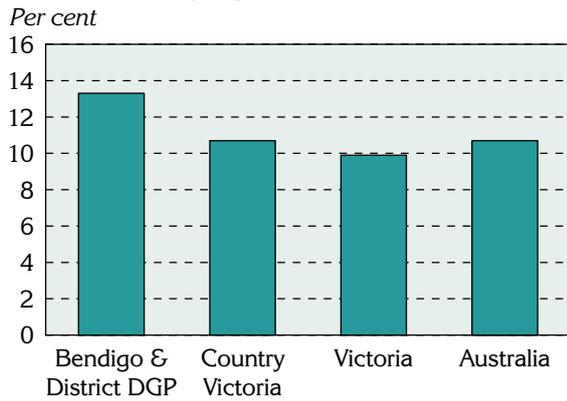
The Division had similar proportions of the population who reported using, at home, a computer (40.4%) and the Internet (23.4%), compared to country Victoria (39.7% and 22.4%).

These socioeconomic indicators show the Division to comprise a population of slightly below average socioeconomic status: see also the note on page 5 (Summary of socioeconomic ranking).

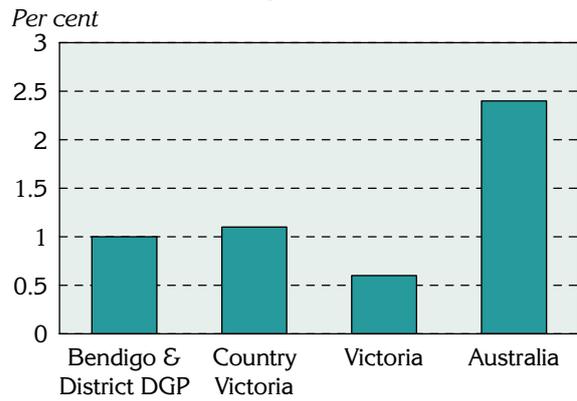
**Figure 3: Socio-demographic indicators, Bendigo and District DGP, country Victoria, Victoria and Australia, 2001**

*Note the different scales*

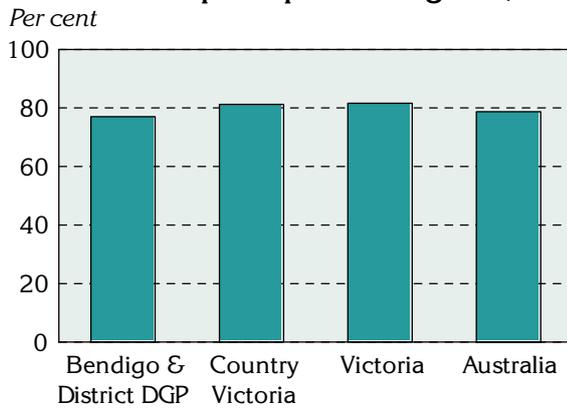
**Single parent families**



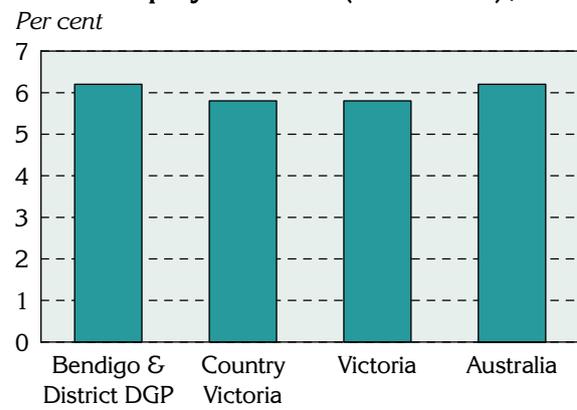
**Indigenous‡**



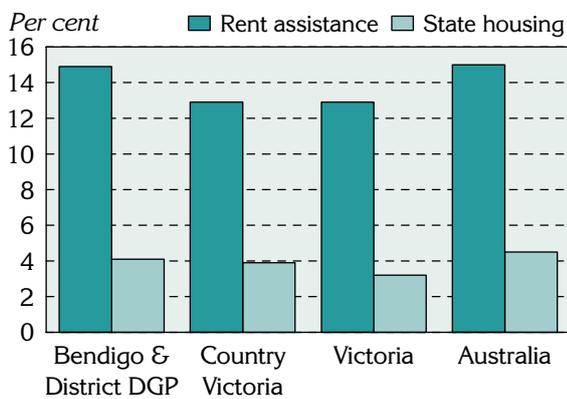
**Education participation at age 16‡**



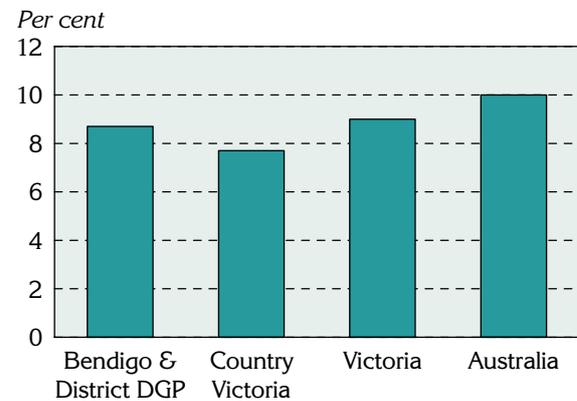
**Unemployment rate (June 2003)‡**



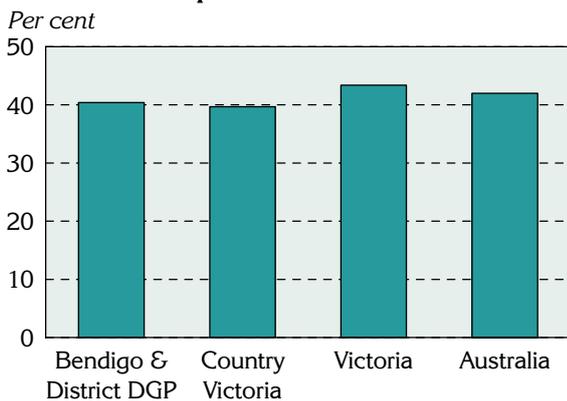
**Households receiving rent assistance & Dwellings rented from State housing authority**



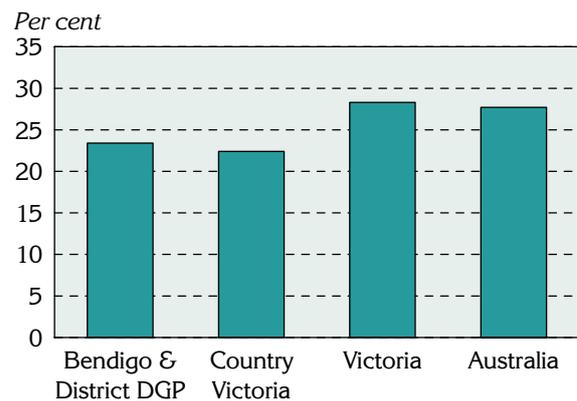
**Dwellings with no motor vehicle**



**Computer use at home**



**Internet use at home**



‡ See note under 'Data converters and mapping' re calculation of Division totals

**Table 3: Socio-demographic indicators, Bendigo and District DGP, country Victoria, Victoria and Australia, 2001**

Indicator	Bendigo and District DGP		Country Victoria		Victoria		Australia	
	No.	%	No.	%	No.	%	No.	%
Single parent families	3,314	13.3	36,341	10.7	120,824	9.9	529,969	10.7
Indigenous‡	964	1.0	15,130	1.1	27,846	0.6	458,261	2.4
Full-time secondary school education at age 16‡	1,119	77.0	16,154	81.2	54,494	81.6	130,198	78.7
Households: rent assistance	5,767	16.3	62,105	12.9	212,587	12.9	1,006,599	15.0
Dwellings rented from the State housing authority	1,501	4.1	18,852	3.9	54,805	3.2	317,171	4.5
Dwellings: no motor vehicle	3,161	8.7	37,538	7.7	155,728	9.0	708,073	10.0
Computer use at home	37,797	40.4	505,663	39.7	2,001,169	43.4	7,881,983	42.0
Internet use at home	22,289	23.4	290,350	22.4	644,806	28.3	2,019,410	27.7

‡ See note under 'Data converters and mapping' re calculation of Division total

The unemployment rate of 6.2% in Bendigo and District DGP was higher than the rates for country Victoria and Victoria (both 5.8%) (Figure 3, Table 4). The labour force participation rate (76.0%) was slightly higher than for country Victoria and Victoria (both 75.3%), while the female labour force participation rate (68.9%) was similar to that for country Victoria (69.0%), and slightly below Victoria (70.6%).

**Table 4: Unemployment and labour force participation, Bendigo and District DGP, country Victoria, Victoria and Australia, 2003**

Labour force indicators	Bendigo and District DGP		Country Victoria		Victoria		Australia	
	No.	%	No.	%	No.	%	No.	%
Unemployment rate ‡	3,096	6.2	41,083	5.8	144,584	5.8	623,791	6.2
Labour force participation‡	49,853	76.0	705,081	75.3	2,492,980	75.3	10,038,147	75.2
Female labour force participation (2001)	15,729	68.9	207,271	69.0	840,995	70.6	3,306,521	69.7

‡ See note under 'Data converters and mapping' re calculation of Division total

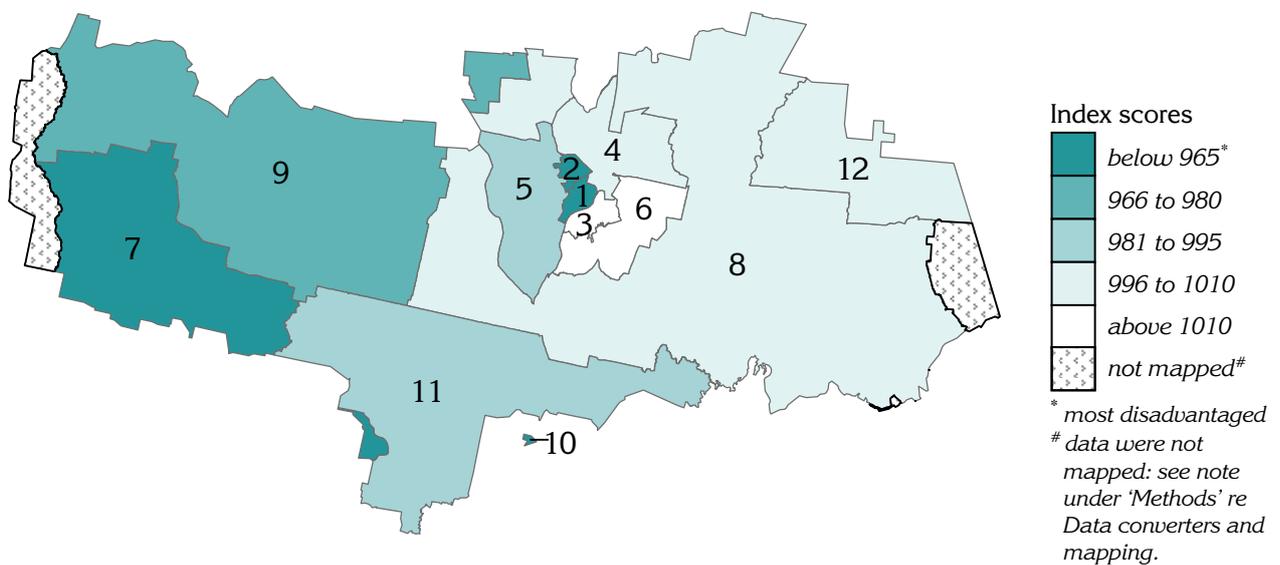
## Summary of the socioeconomic ranking of the Bendigo and District DGP

Following the 2001 Census, the Australian Bureau of Statistics (ABS) produced four socio-economic indexes for areas (SEIFA) which describe various aspects of the socioeconomic profile of populations in areas. The scores for these indexes for each Statistical Local Area (SLA) or part SLA in Bendigo and District DGP are shown in the supporting information, Table 9, page 18: SLAs are described on page 18.

The Bendigo and District DGP area's SEIFA Index of Relative Socio-Economic Disadvantage (IRSD) score is 989, marginally (1.1%) below the average scores for Australia (1000) and for country Victoria (999); this highlights the marginally lower socioeconomic status profile of the Bendigo and District DGP population. There are marked variations in the IRSD at the SLA level within the Division (Map 1).

### Map 1: Index of Relative Socio-Economic Disadvantage, by SLA, Bendigo and District DGP, 2001

*See note under 'Methods' re Data converters and mapping concerning SLAs mapped to the Division. This is of particular relevance where part of an SLA is mapped to the Division.*



#### Alphabetical key to Statistical Local Areas, Bendigo and District DGP, 2001

Campaspe - South	12	Greater Bendigo - Inner West	5
Central Goldfields Balance	7	Greater Bendigo - Part B	8
Greater Bendigo - Central	1	Greater Bendigo - Strathfieldsaye	6
Greater Bendigo - Eaglehawk	2	Loddon - South	9
Greater Bendigo - Inner East	3	Mount Alexander Balance	11
Greater Bendigo - Inner North	4	Mount Alexander - Castlemaine	10

## General medical practitioner (GP) supply

A total of 63.1 full-time equivalent (FTE) GPs, and 68.7 full-time workload equivalent (FWE<sup>2</sup>) GPs worked in the Bendigo and District DGP in 2003/04 (Table 5). Of the FWE GPs, 22.6% were female, and 35.9% were over 55 years of age (compared to 25.6% and 28.3%, respectively, for Victoria).

Apart from the estimated day-time population, the rates of population per FTE GP varied, depending on the population measure used, from a high of 1,613 people per GP (calculated on the average Estimated Residential Population (ERP) as at 30 June 2003 and 2004), to a low of 1,529 people per GP (calculated on the 1 August 2001 Census count – all people counted in the Division on Census night, including visitors from Australia and overseas). The rates of population per FWE GP were lower, ranging from 1,406 (calculated on the Census count) to 1,483 (calculated on the ERP). When calculated on the estimated day-time population, the rates of population per GP were 3.9% below those calculated on the Usual Resident Population (usual residents of the Division counted in Australia on Census night).

Based on the ERP, the rates of population per GP in Bendigo and District DGP were higher than the rates for Victoria and Australia, indicating a lower level of provision of GP services in the Division.

**Table 5: Population per GP in Bendigo and District DGP, Victoria and Australia, 2003/04**

Population measure	Population	GPs		Population per GP	
		FTE	FWE	FTE	FWE
<b>Bendigo and District DGP</b>					
Census count (adjusted)*	96,532	63.1	68.7	1,529	1,406
Usual Resident Population (URP) (adjusted)*	98,257	..	..	1,557	1,431
Estimated Resident Population (ERP)	101,832	..	..	1,613	1,483
Day-time population (estimated on the URP)* ‡	94,384	..	..	1,495	1,375
<b>Victoria (ERP)</b>	<b>4,942,102</b>	<b>3,575</b>	<b>4,157</b>	<b>1,382</b>	<b>1,189</b>
<b>Australia (ERP)</b>	<b>19,989,303</b>	<b>14,246</b>	<b>16,872</b>	<b>1,403</b>	<b>1,185</b>

\* The Census count, Usual Resident Population and Day-time population were adjusted to reflect population change between 2001 and 2003/04, as measured by the ERP

‡ See note under 'Data converters and mapping' re calculation of Division totals

## Immunisation

Data from the Australian Childhood Immunisation Register show that 94.1% of children in the Division in 2002 were fully immunised at age one, consistent with the Australian proportion of 94.2%.

Immunisation by provider type for children between the ages of 0 to 6 is shown in Table 6. Less than half of children in the Division who were immunised were immunised by a general practitioner (49.9%), compared to 70.0% for Australia, with 50.1% immunised at a local government council.

**Table 6: Childhood immunisation at ages 0 to 6 by provider type, Bendigo and District DGP and Australia, 2003/04**

Provider	Bendigo and District DGP	Australia
	%	%
General practitioner	49.9	70.0
Local government council	50.1	16.6
Community health centre/ worker	0.0	9.8
Public hospital	0.0	2.1
Aboriginal health service/ worker	0.0	0.9
Other*	0.0	0.6
<b>Total: Per cent</b>	<b>100.0</b>	<b>100.0</b>
<b>Number</b>	<b>17,605</b>	<b>3,843,610</b>

\* Includes immunisations in/ by State Health Departments, RFDS and private hospitals

<sup>2</sup> The FWE value is calculated for each GP location by dividing the GP's total Medicare billing (Schedule fee value of services provided during the reference period) by the mean billing of full-time doctors in that derived major speciality for the reference period. Thus, a GP earning 20% more than the mean billing of full-time doctors is shown as 1.2 FWE: this differs from full-time equivalent (FTE) counts, where the FTE value of any GP cannot exceed 1.0

## Premature mortality

Deaths at ages below 75 years are used as an indicator of health status, as they largely reflect premature deaths, given the current levels of life expectancy in Australia.

The 'all causes' death rate in the Division at ages 0 to 74 years (321.1 deaths per 100,000 population) is higher than for country Victoria (316.8) and well above that for Australia (290.4): the rates have been age standardised to allow for comparisons between areas, regardless of differences in age profiles between the Division and Australia.

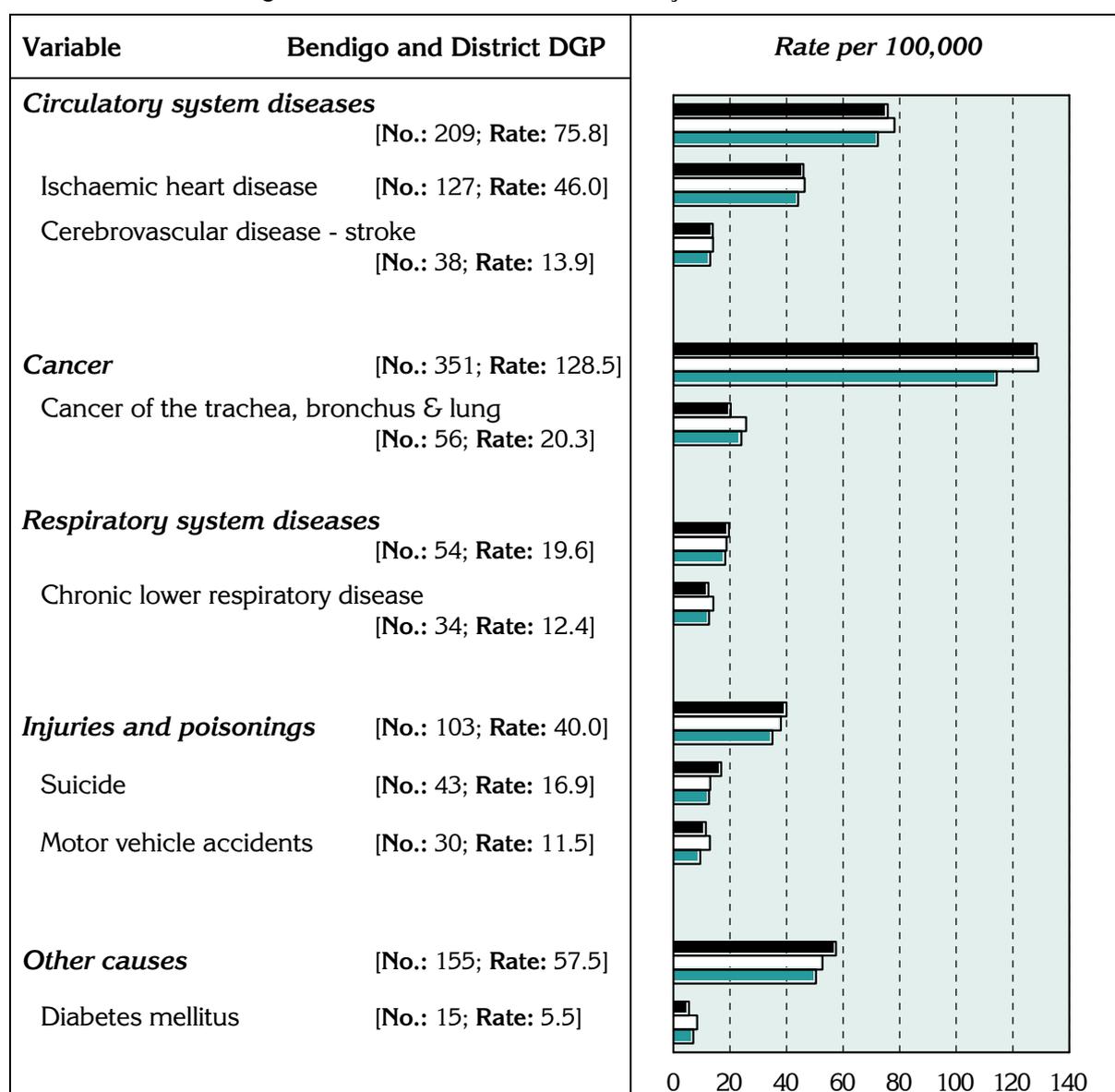
The major causes of premature mortality in the Division, as for country Victoria and Australia as a whole, are cancer and diseases of the circulatory system (Figure 4). Death rates in the Division for all of the major condition groups were higher than those for Australia. The Division's death rates for circulatory diseases and cancer were, however, marginally lower than those for country Victoria.

The data on which the following chart is based are in Table 12.

**Figure 4: Deaths before 75 years of age by major condition group and selected cause, Bendigo and District DGP‡, country Victoria and Australia, 2000-02\***

*Indirectly age standardised rate per 100,000 population*

■ Bendigo and District DGP    □ Country Victoria    ■ Australia



\* 'No.' is the total number of deaths for the 2000-02 period; 'Rate' is an annual rate, based on the 3 year average

‡ See note under 'Data converters and mapping' re calculation of Division totals

## Chronic diseases and risk factors

*The term “chronic disease” describes health problems that persist across time and require some degree of health care management (WHO 2002). Chronic diseases tend to have complex causes, are often long lasting and persistent in their effects, and can produce a range of complications (Thacker et al. 1995). They are responsible for a significant proportion of the burden of disease and illness in Australia and other westernised countries. Given the ageing of the population, this trend is likely to continue.*

*At different life stages, risk factors for chronic diseases and their determinants include genetic predisposition; poor diet and lack of exercise; alcohol misuse and tobacco smoking; poor intra-uterine conditions; stress, violence and traumatic experiences; and inadequate living environments that fail to promote healthy lifestyles (NPHP 2001). Risk factors are also more prevalent in areas of low socioeconomic status, and in communities characterised by low levels of educational attainment; high levels of unemployment; substantial levels of discrimination, interpersonal violence and exclusion; and poverty. There is a higher prevalence of risk factors among Indigenous communities, and other socioeconomically disadvantaged Australians (NPHP 2001).*

## Background

In this section, estimates of the prevalence of selected chronic diseases and risk factors, and two summary measures of health, are shown for the Division‡, and for SLAs within the Division: note that the estimates have been predicted from self-reported data, and are not based on clinical records or physical measures. The chronic diseases and risk factors are those for which sufficiently reliable estimates can be made for the Division from national survey data. The process by which the estimates have been made, and details of their limitations, are described in the Notes section, pages 15-16. The data on which the following charts are based are in Table 13.

The estimates provide information of relevance to a number of the National Health Priority Areas (NHPAs – asthma; cardiovascular health; diabetes mellitus; injury prevention and control; mental health; and arthritis and musculoskeletal conditions: estimates have not been made for cancer control, the other NHPA). The risk factors for which estimates have been made are those which are accepted as being associated with these important chronic conditions. They are overweight (not obese), obesity, smoking, lack of exercise and high-risk alcohol use.

*The numbers are estimates for an area, not measured events as are death statistics: they should be used as indicators of likely levels (and not actual levels) of a condition or risk factor in an area.*

## Prevalence estimates: chronic disease‡

It is estimated that, with the exceptions of respiratory system diseases, diabetes type 2 and osteoporosis (females), relatively more people in Bendigo and District DGP reported having any of the selected chronic conditions than in Australia as a whole (Figure 5): that is, the prevalence rates per 1,000 population were higher. The generally higher rates are consistent with the socioeconomic status profile of the population of the Division.

## Prevalence estimates: self-reported health‡

The NHS includes two measures of self-reported health. One is the Kessler Psychological Distress Scale–10 items (K–10). This is a scale of non-specific psychological distress based on 10 questions about negative emotional states in the four weeks prior to interview, asked of respondents 18 years and over (ABS 2002). The other asks respondents aged 15 years and over to rate their health on a scale from ‘excellent’, through ‘very good’, ‘good’ and ‘fair’, to ‘poor’ health.

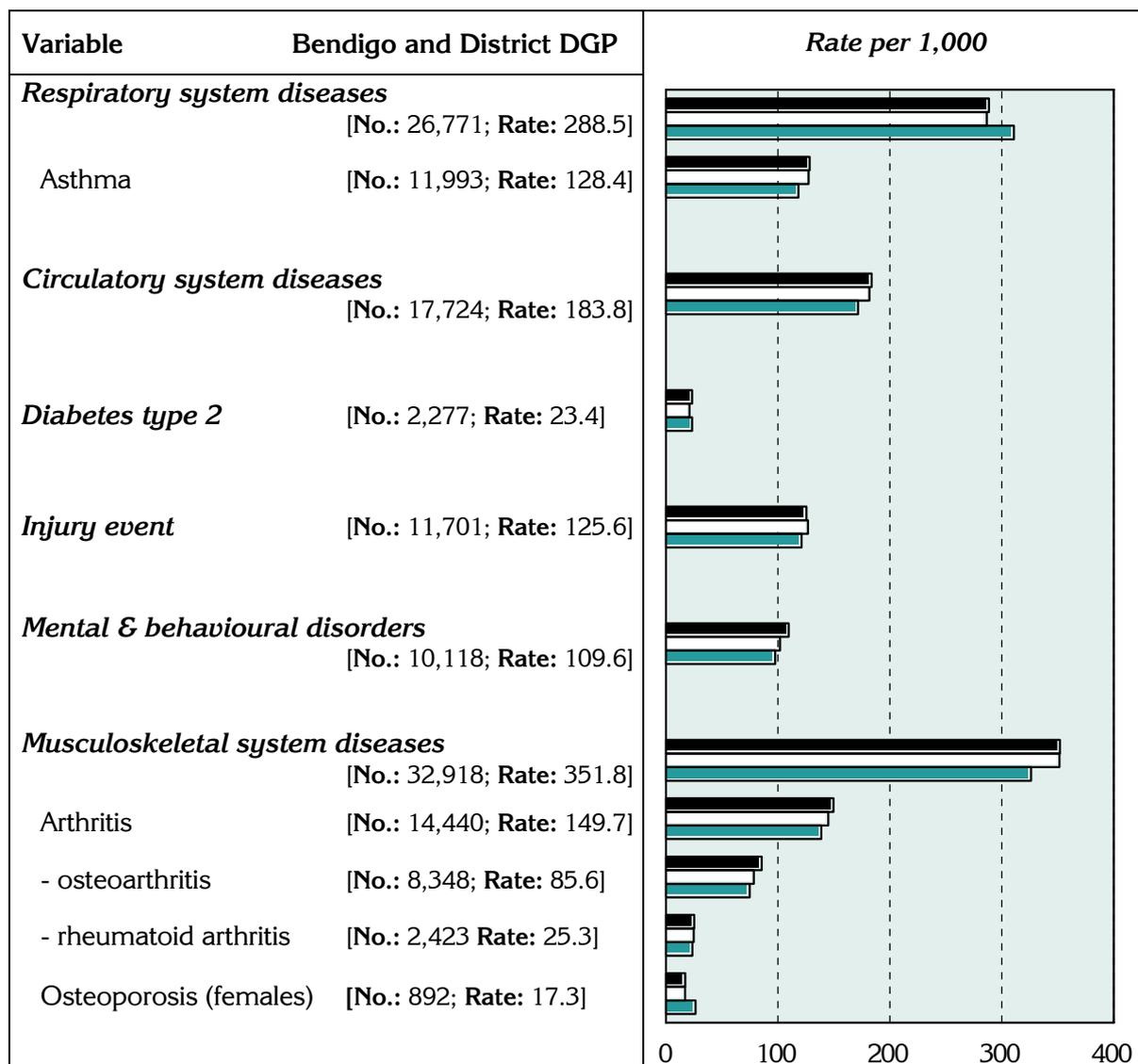
The population of the Division aged 18 years and over is estimated to have relatively slightly more people with very high psychological distress levels as measured by the K–10 compared to Australia as a whole (Figure 6). Conversely, the proportion of the population aged 15 years and over estimated to have reported their health as ‘fair’ or ‘poor’ is below the national average.

‡ See note under ‘Data converters and mapping’ re calculation of Division totals

Figure 5: Estimates\* of chronic disease and injury, Bendigo and District DGP‡, country Victoria and Australia, 2001

Indirectly age standardised rate per 1,000 population

■ Bendigo and District DGP    □ Country Victoria    ■ Australia



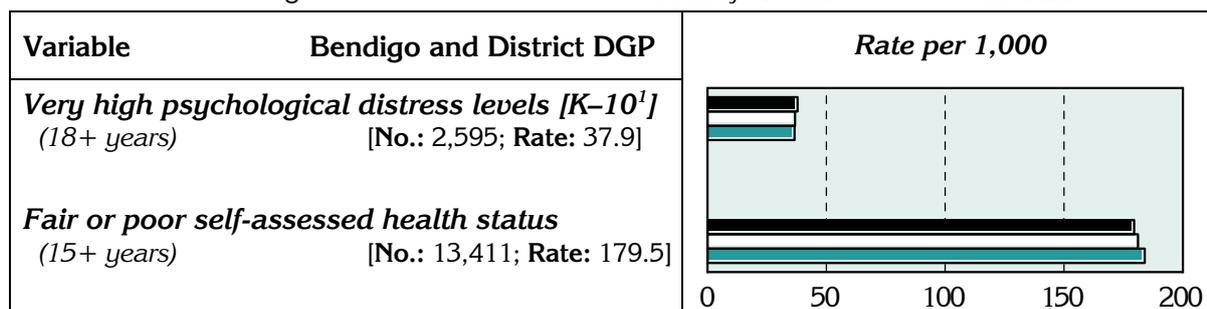
\* 'No.' is a weighted estimate of the number of people in Bendigo and District DGP reporting each chronic condition and is derived from synthetic predictions from the 2001 NHS

‡ See note under 'Data converters and mapping' re calculation of Division totals

Figure 6: Estimates\* of measures of self-reported health, Bendigo and District DGP‡, country Victoria and Australia, 2001

Indirectly age standardised rate per 1,000 population

■ Bendigo and District DGP    □ Country Victoria    ■ Australia



\* 'No.' is a weighted estimate of the number of people in Bendigo and District DGP reporting under these measures and is derived from synthetic predictions from the 2001 NHS

<sup>1</sup> Kessler 10

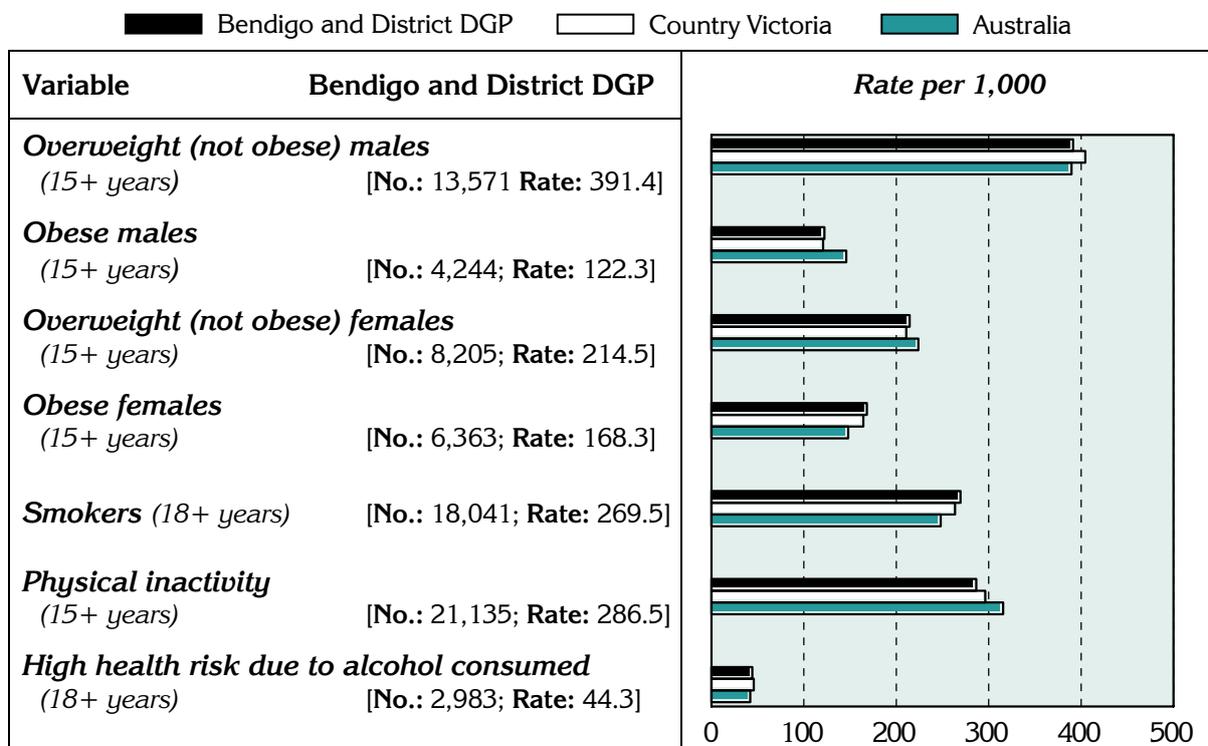
‡ See note under 'Data converters and mapping' re calculation of Division totals

## Prevalence estimates: risk factors‡

The population in the Division is estimated to have lower rates (when compared with the Australian population) for obesity in males, overweight in females, and lack of exercise (Figure 7). The rates for obesity in females, smoking and high-risk alcohol consumption are above the Australian average rates.

**Figure 7: Estimates\* of selected risk factors, Bendigo and District DGP‡, country Victoria and Australia, 2001**

*Indirectly age standardised rate per 1,000 population*



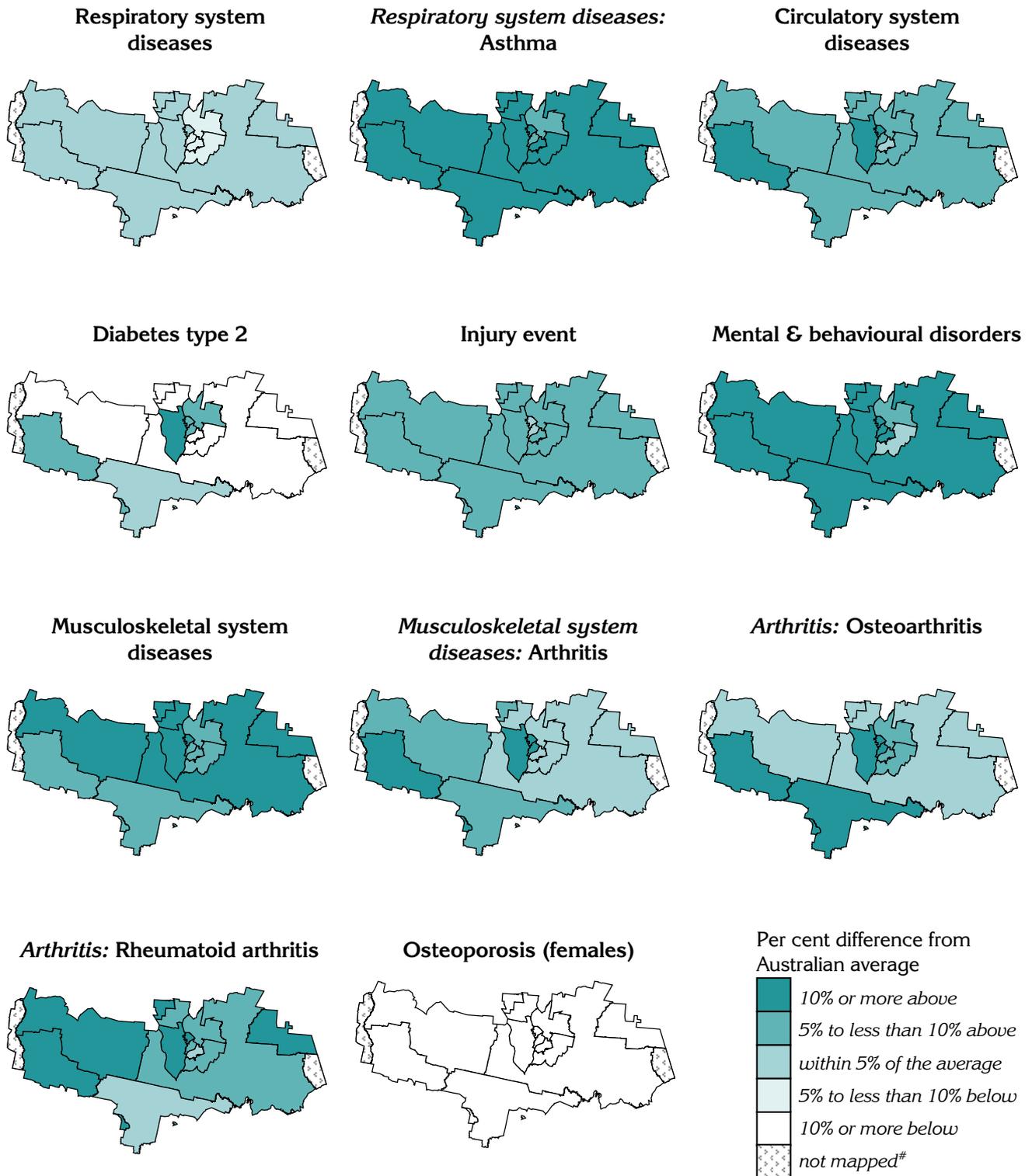
\* 'No.' is a weighted estimate of the number of people in Bendigo and District DGP with these risk factors and has been predicted using data from the 2001 NHS and known data for the Division

‡ See note under 'Data converters and mapping' re calculation of Division totals

The following maps provide details of the geographic distribution, at the SLA level, of the estimated prevalence of chronic disease (Map 2), self-reported health (Map 3) and risk factors associated with chronic disease (Map 4).

In the following maps, users should note that the estimates shown for part SLAs in the Division (see Table 11, page 18, for per cent of SLA population in the Division) represent the estimates for the whole SLA, and not just the part shown. However, SLAs with only a small proportion of their population in the Division are likely to have little influence on the total estimates for the Division, which have been based on the percentage of the SLA population in the Division.

Map 2: Estimates\* of chronic disease and injury by SLA, Bendigo and District DGP, 2001



\* The estimates are synthetic predictions of the prevalence of these conditions: see Notes on the data.

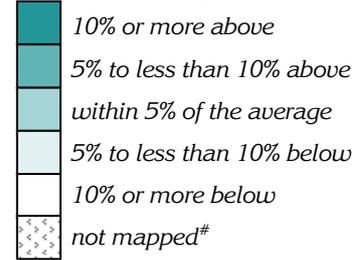
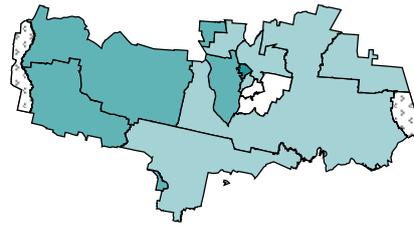
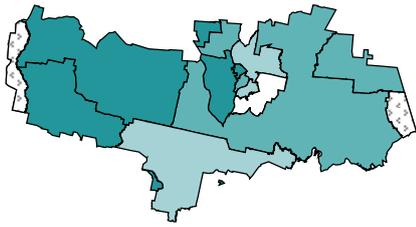
# Data not mapped: see Notes on the data.

**Map 3: Estimates\* of measures of self-reported health by SLA, Bendigo and District DGP, 2001**

**Very high psychological distress levels [K-10<sup>1</sup>] (18+ years)**

**Fair or poor self-assessed health status (15+ years)**

Per cent difference from Australian average



<sup>1</sup> Kessler 10

\* The estimates are synthetic predictions of the prevalence of these conditions: see Notes on the data.

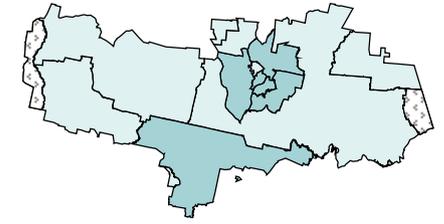
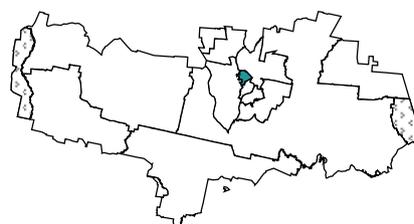
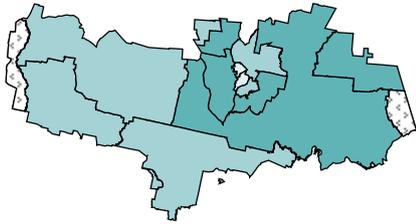
# Data not mapped: see Notes on the data.

**Map 4: Estimates\* of selected risk factors by SLA, Bendigo and District DGP, 2001**

**Overweight (not obese) males (15+ years)**

**Obese males (15+ years)**

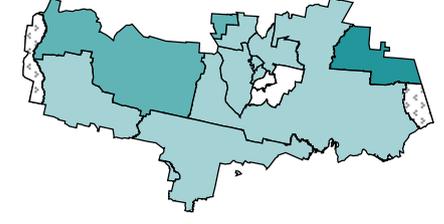
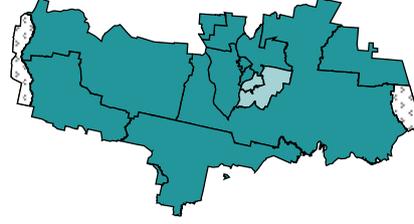
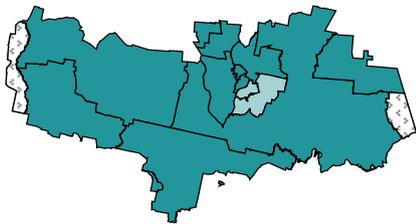
**Overweight (not obese) females (15+ years)**



**Obese females (15+ years)**

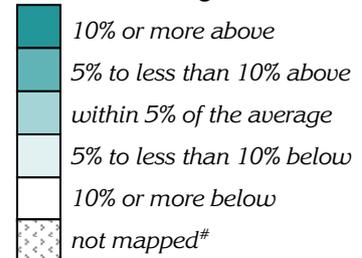
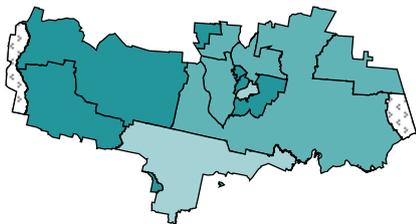
**Smokers (18+ years)**

**Physical inactivity (15+ years)**



**High health risk due to alcohol consumed (18+ years)**

Per cent difference from Australian average



\* The estimates are synthetic predictions of the prevalence of these conditions: see Notes on the data.

# Data not mapped: see Notes on the data.

# Notes on the data

## Data sources and limitations

### General

References to 'country Victoria' relate to Victoria excluding the Melbourne Statistical Division.

### Data sources

Table 7 details the data sources for the material presented in this profile.

**Table 7: Data sources**

Section	Source
<b>Key indicators</b>	
GP services per head of population	GP services data supplied by Department of Health and Ageing, 2003/04 Population data: Estimated Resident Population, ABS, mean of 30 June 2003 and 30 June 2004 populations
<b>Socio-demographic profile</b>	
Figures 1 and 2; Table 1	Estimated Resident Population, ABS, 30 June for the periods shown
Tables 2, 3 and 4; Figure 3	Data were extracted by postal area from the ABS Population Census 2001 <sup>1</sup> , except for the following indicators: - <i>Indigenous</i> – Experimental estimates of Aboriginal and Torres Strait Islander people, ABS 2001 (unpublished) - <i>Full-time secondary education participation at age 16</i> – Census 2001 (unpublished) - <i>Households receiving rent assistance</i> – Centrelink, December Quarter 2001 (unpublished) - <i>Unemployment rate / Labour force participation</i> – extracted from <i>Small Area Labour Markets Australia</i> , June Quarter 2003, Department of Employment and Workplace Relations
Map 1; Table 9	ABS SEIFA package, Census 2001
<b>General medical practitioner (GP) supply</b>	
Table 5	GP data supplied by Department of Health and Ageing, 2003/04 Population estimates used in calculating the population per GP rates are the: - Census count <sup>2</sup> , ABS Population Census 2001, scaled to 2003/04 - Usual Resident Population <sup>3</sup> , ABS Population Census 2001, scaled to 2003/04 - Day-time population: calculated from journey to work data, ABS Population Census (URP) 2001 (unpublished); and 2001 Census URP, scaled to 2003/04 - Estimated Resident Population, ABS, June 2003/2004
<b>Immunisation</b>	
Text comment: 1 year olds	National Centre for Immunisation Research and Surveillance, 2002
Table 6	Australian Childhood Immunisation Register, Health Insurance Commission, 2003/04 (unpublished)
<b>Premature mortality</b>	
Figure 4; Table 12	ABS Deaths, 2000 to 2002
<b>Chronic diseases and associated risk factors<sup>4</sup></b>	
Figures 5, 6 and 7; Maps 2, 3 and 4; Table 13	Estimated from 2001 National Health Survey (NHS), ABS (unpublished)

<sup>1</sup> All data extracted from Usual Residents Profile, except for data variables only released in the Basic Community Profile

<sup>2</sup> *Census count* - those counted in the Division on Census night, including tourists, business people and other visitors

<sup>3</sup> *Usual Resident Population* - those who usually live there and who were in Australia at the time and would have provided details in the Census at the address where they were counted

<sup>4</sup> See notes below

## Chronic diseases and associated risk factors

The data for chronic conditions and risk factors for SLAs have been estimated from the 2001 National Health Survey (NHS), conducted by the ABS: see note below on synthetic estimates. The NHS sample includes the majority of people living in private households, but excludes the most remote areas of Australia. These areas cover 86.4% of Australia's land mass and comprise just 3% of the total population, however, 28% of Australia's Indigenous population live in these areas. Thus it has not been possible to produce these estimates for Divisions with relatively high proportions of their population in the most remote areas of Australia.

The data for chronic conditions and risk factors are self-reported data, reported to interviewers in the 2001 NHS. Table 8 includes notes relevant to this data.

**Table 8: Notes on estimates of chronic diseases and associated risk factors**

Indicator	Notes on the data
<b>Estimates of chronic disease and injury</b> (Figure 5 and Map 2)	
Long term conditions	- Respondents were asked whether they had been diagnosed with any long term health condition (a condition which has lasted or is expected to last for 6 months or more), and were also asked whether they had been told by a doctor or nurse that they had asthma, cancer, heart and circulatory conditions, and/or diabetes
Injury event	- Injuries which occurred in the four weeks prior to interview
<b>Estimates of measures of self-reported health</b> (Figure 6 and Map 3)	
Very high psychological distress levels (K10)	- Derived from the Kessler Psychological Distress Scale-10 items (K-10), which is a scale of non-specific psychological distress based on 10 questions about negative emotional states in the 4 weeks prior to interview. 'Very high' distress is the highest level of distress category (of a total of four categories)
Fair or poor self-assessed health status	- Respondent's general assessment of their own health, against a five point scale from excellent through to poor – 'fair' or 'poor' being the two lowest in the scale
<b>Estimates of selected risk factors</b> (Figure 7 and Map 4)	
Overweight (not obese)	- Based on self-reported height and weight; BMI calculated and grouped into categories (to allow reporting against both WHO and NHMRC guidelines) - overweight: 25.0 to less than 30.0
Obese	- Based on self-reported height and weight; BMI calculated and grouped into categories (to allow reporting against both WHO and NHMRC guidelines) – obese: 30.0 and greater
Smokers	- Respondent's undertaking regular (or daily) smoking at the time of interview
Physical inactivity	- Did not exercise in the two weeks prior to interview through sport, recreation or fitness (including walking) – excludes incidental exercise undertaken for other reasons, such as for work or while engaged in domestic duties
High health risk due to alcohol consumed	- Respondent's estimated average daily alcohol consumption in the seven days prior to interview (based on number of days and quantity consumed). Alcohol risk levels were grouped according to NHMRC risk levels for harm in the long term, with 'high risk' defined as a daily consumption of more than 75 ml for males and 50 ml for females

**Note:** For a full description, refer to *ABS 2001 National Health Survey, Cat. No. 4364.0* and *ABS 2001 Health Risk Factors, Cat. No. 4812.0*

## Methods

### Synthetic estimates

The estimates of the prevalence of chronic disease and associated risk factors have been predicted for a majority of SLAs across Australia, using modelled survey data collected in the 2001 ABS National Health Survey (NHS) and known characteristics of the area. A synthetic prediction can be interpreted as the likely value for a 'typical' area with those characteristics: the SLA is the area level of interest for this project (where SLAs had small populations they were grouped to larger areas). This work was undertaken by the Australian Bureau of Statistics, as they hold the NHS unit record files: the small area data were compiled by PHIDU.

The approach used is to undertake an analysis of the survey data for Australia to identify associations in the NHS data between the variables that we wish to predict at the area level (eg. prevalence of chronic conditions and risk factors) and the data we have at the area level (eg. socioeconomic status, use of health services). The relationship between these variables for which we have area level data (the predictors) and the reporting of chronic conditions in the NHS is also a part of the model that is developed by the ABS. For example, such associations might be between the number of people reporting specified chronic conditions in the NHS and:

- the number of hospital admissions (in total, to public and to private hospitals, by age, sex and diagnosis),
- socioeconomic status (as indicated by Census data, or for recipients of government pensions and benefits), and
- the number of visits to a general medical practitioner.

The results of the modelling exercise are then applied to the SLA counts of the predictors. The prediction is, effectively, the likely value for a typical area with those characteristics. The raw numbers were then age-standardised, to control for the effects of differences in the age profiles of areas.

*The numbers are estimates for an area, not measured events as are death statistics: they should be used as indicators of likely levels of a condition or risk factor in an area.*

### Premature deaths

Details of deaths by SLA were purchased from the ABS. The raw numbers were then age-standardised, by the indirect method, to control for the effects of differences in the age profiles of areas.

### Data converters and mapping

#### [Conversion to Division of data available by postcode](#)

The allocation of postcodes to Divisions was undertaken using information from the Department of Health and Ageing's web site, which shows the proportion of a postcode in a Division (Table 10).

#### [Conversion to Division of data available by SLA](#)

(marked in this profile as ‡ See note under 'Data converters and mapping' re calculation of Division total)

Where the data presented in these profiles were only available by SLA they have been converted to Division of General Practice areas using a concordance based on data at the 2001 Census. A copy of the concordance is included in the Population data: A Guide for Divisions of General Practice: it is also available from the Divisions' data area on PHIDU web site.

In brief, the concordance splits the data (eg number of deaths) for each SLA across one or more Divisions. The proportion of an SLA's data that is allocated to each Division was calculated from (a) CD level Census 2001 data that splits SLAs across approximations to postcodes (referred to as postal areas) and (b) data on the DoHA website that splits postcodes across Divisions. This concordance can be adjusted to meet any new configuration of Division boundaries based on the 2001 Collection Districts, or combinations thereof.

The estimated population of each SLA in this Division is shown in Table 11.

#### [Mapping](#)

In some Divisions the maps may include a very small part of an SLA which has not been allocated any population, or either has a population of less than 100 or has less than 1% of the SLA's total population: these areas are mapped with a pattern.

## Supporting information

This and other information is also available at [www.publichealth.gov.au](http://www.publichealth.gov.au)

### A definition of population health

Population health, in the context of general practice, has been defined<sup>1</sup> as:

*“The prevention of illness, injury and disability, reduction in the burden of illness and rehabilitation of those with a chronic disease. This recognises the social, cultural and political determinants of health. This is achieved through the organised and systematic responses to improve, protect and restore the health of populations and individuals. This includes both opportunistic and planned interventions in the general practice setting.”*

The key determinants of health are social support networks, employment and working conditions, social environments, physical environments, geographical isolation, personal health practices, healthy child development, ageing and disability, biology and genetic endowment, health services, gender and culture.

In the Aboriginal and Torres Strait Islander context this means that a population health approach to health services will assist in ensuring “that Aboriginal and Torres Strait Islander people enjoy a healthy life equal to that of the general population, that is enshrined by a strong living culture, dignity and justice”.<sup>2</sup> This recognises the importance of achieving improvements to Aboriginal and Torres Strait Islander health and respects the particular health issues facing Indigenous people.

<sup>1</sup> “The role of general practice in population health – A Joint Consensus Statement of the General Practice Partnership Advisory Council and the National Public Health Partnership Group” (Joint Advisory Group on General Practice and Population Health 2001)

<sup>2</sup> As defined in the Strategic Framework for Aboriginal and Torres Strait Islander Health

### SEIFA scores

Following the 2001 Census, the Australian Bureau of Statistics (ABS) produced four socioeconomic indexes for areas (SEIFA). The indexes describe various aspects of the socioeconomic make-up of populations in areas, using data collected in the 2001 Census.

The Index of Relative Socio-Economic Disadvantage (labelled ‘Disadvantage’ in Table 9) includes all variables that either reflect or measure disadvantage. The Index of Advantage/Disadvantage is used to rank areas in terms of both advantage and disadvantage: any information on advantaged persons in an area will offset information on disadvantaged persons in the area. The Index of Economic Resources and the Index of Education and Occupation were targeted towards specific aspects of advantage/disadvantage.

For further information on the composition and calculation of these indexes see the ABS Information Paper ABS Cat No. 2039.0 available on the ABS web site [www.abs.gov.au](http://www.abs.gov.au). The scores for these indexes for each Statistical Local Area (SLA) or part SLA in Bendigo and District DGP are shown in Table 9.

**In using this table, users should note that the index score shown for SLAs with less than 100 per cent in the Division represents the score for the whole SLA, and not just the part shown. However, SLAs with small proportions may have little influence on the average index score for the Division which has been based on the postcodes in the Division.**

**Table 9: SEIFA scores by SLA, Bendigo and District DGP, 2001**

SLA code	SLA name (£ per cent of SLA in the Division)	Index score			
		Disadvantage	Advantage- Disadvantage	Economic- Resource	Education- Occupation
21376	Campaspe - South (6.4)	996	922	911	929
21674	C. Goldfields Balance (40.5)	965	892	867	916
22621	Greater Bendigo - Central (100.0)	948	935	924	960
22622	Greater Bendigo - Eaglehawk(100.0)	904	880	900	886
22623	Greater Bendigo - Inner East (100.0)	1029	1013	978	1039
22624	Greater Bendigo - Inner North(100.0)	1003	943	943	941
22625	Greater Bendigo - Inner West(100.0)	988	947	943	949
22626	Greater Bendigo - S'saye (100.0)	1083	1043	1009	1049
22628	Greater Bendigo - Part B (76.8)	1005	951	928	963
23945	Loddon - South (25.2)	968	893	861	923
25431	Mount Alexander - C'maine (30.0)	961	942	917	973
25434	Mount Alexander Balance (48.7)	989	944	914	972

\* Proportions are approximate and are known to be incorrect in some cases, due to errors in the concordance used to allocate CDs to form postal areas

### Statistical geography of the Bendigo and District DGP

The Bendigo and District DGP covers 4,748 square kilometres, based on 2001 SLA data.

Postcodes in the Division (as per the Department of Health and Ageing website) are shown in Table 10.

**Table 10: Postcodes in Bendigo and District DGP, 2004**

Postcode	Per cent of postcode population in the Division *	Postcode	Per cent of postcode population in the Division *	Postcode	Per cent of postcode population in the Division *
3450	30	3515	100	3552	100
3453	100	3523	90	3554	100
3462	100	3539	100	3555	100
3463	100	3550	100	3556	100
3472	100	3551	100	3557	100
3475	100				

\* Proportions are approximate

Source: Department of Health and Ageing web site (accessed online version as at February 2005):

<http://www.health.gov.au/internet/wcms/publishing.nsf/Content/health-pcd-programs-divisions-divspc.htm>

Statistical Local Areas (SLAs) are defined by the Australian Bureau of Statistics to produce areas for the presentation and analysis of data. In this Division, Local Government Areas (LGAs) have been split into SLAs. For example, the LGA of Mount Alexander has two SLAs – Castlemaine and Balance. Parts of these SLAs and all or parts of the other SLAs in Table 11 comprise the Division.

**Table 11: SLAs in Bendigo and District DGP by 2001 boundaries**

SLA code	SLA name	Per cent of the SLA's population in the Division *	Estimate of the SLA's 2004 population in the Division
21376	Campaspe - South	6.4	241
21674	Central Goldfields Balance	40.5	2,148
22621	Greater Bendigo - Central	100.0	18,863
22622	Greater Bendigo - Eaglehawk	100.0	8,969
22623	Greater Bendigo - Inner East	100.0	23,829
22624	Greater Bendigo - Inner North	100.0	8,969
22625	Greater Bendigo - Inner West	100.0	15,987
22626	Greater Bendigo - Strathfieldsaye	100.0	6,442
22628	Greater Bendigo - Part B	76.8	8,734
23945	Loddon - South	25.2	1,248
25431	Mount Alexander - Castlemaine	30.0	2,192
25434	Mount Alexander Balance	48.7	4,821

\* Proportions are approximate and are known to be incorrect in some cases, due to errors in the concordance used to allocate CDs to form postal areas

## Supporting data

The data used in Figure 4 to illustrate the rates of premature mortality in the Division are shown below in Table 12.

**Table 12: Deaths before 75 years of age by major condition group and selected cause, Bendigo and District DGP‡, country Victoria and Australia, 2000-02\***

*Indirectly age standardised rate per 100,000 population*

Variable	Bendigo and District DGP‡		Country Victoria		Australia	
	No.	Rate	No.	Rate	No.	Rate
<b>Circulatory diseases</b>	209	75.8	3,163	78.2	38,357	72.3
Ischaemic heart disease	127	46.0	1,879	46.4	23,364	44.1
Cerebrovascular disease – stroke	38	13.9	568	14.0	6,920	13.0
<b>Cancer</b>	351	128.5	5,188	129.0	60,603	114.3
Cancer of the trachea, bronchus & lung	56	20.3	1,039	25.7	12,715	24.0
<b>Respiratory diseases</b>	54	19.6	765	18.8	9,726	18.3
Chronic lower respiratory disease	34	12.4	574	14.1	6,657	12.6
<b>Injuries and poisonings</b>	103	40.0	1,406	38.0	18,573	35.0
Suicide	43	16.9	477	13.0	6,706	12.6
Motor vehicle accidents	30	11.5	473	12.9	5,014	9.5
<b>Other causes</b>	155	57.5	2,089	52.7	26,735	50.4
Diabetes mellitus	15	5.5	343	8.4	3,734	7.0

\* 'No.' is the total number of deaths for the 2000-02 period; 'Rate' is an annual rate, based on the 3 year average

‡ See note under 'Data converters and mapping' re calculation of Division totals

The rates used to illustrate the prevalence estimates of chronic disease and injury (Figure 5), measures of self-reported health (Figure 6), and selected risk factors (Figure 7), are shown in Table 13 below.

**Table 13: Estimates of chronic disease and associated risk factors, Bendigo and District DGP‡, country Victoria and Australia, 2001**

*Indirectly age standardised rate per 1,000 population*

Variable	Bendigo and District DGP‡	Country Victoria	Australia
<b>Chronic disease and injury (Figure 5)</b>			
Respiratory system diseases	288.5	286.6	310.8
Asthma	128.4	127.5	118.3
Circulatory system diseases	183.8	181.8	171.5
Diabetes type 2	23.4	21.1	23.4
Injury event	125.6	126.8	121.2
Mental & behavioural disorders	109.6	101.9	97.6
Musculoskeletal system diseases	351.8	351.4	326.2
Arthritis	149.7	145.0	138.8
- Osteoarthritis	85.6	78.6	74.9
- Rheumatoid arthritis	25.3	24.9	23.6
Osteoporosis (females)	17.3	17.1	26.4
<b>Measures of self-reported health (Figure 6)</b>			
Very high psychological distress levels (18+ years)	37.9	36.8	36.6
Fair or poor self-assessed health status (15+ years)	179.5	181.1	184.0
<b>Risk factors (Figure 7)</b>			
Overweight (not obese) males (15+ years)	391.4	404.6	389.7
Obese males (15+ years)	122.3	120.9	145.9
Overweight (not obese) females (15+ years)	214.5	210.8	223.9
Obese females (15+ years)	168.3	164.4	148.0
Smokers (18+ years)	269.5	263.6	248.0
Physical inactivity (15+ years)	286.5	296.3	315.5
High health risk due to alcohol consumed (18+ years)	44.3	45.9	42.1

‡ See note under 'Data converters and mapping' re calculation of Division totals

## References

Australian Bureau of Statistics (ABS) (2002). *2001 National Health Survey: summary of results*. Australia. (ABS Cat. No. 4364.0). Canberra: ABS.

National Public Health Partnership (NPHP) (2001). *Preventing Chronic Disease: A Strategic Framework*. Melbourne, Victoria.

Thacker S, Stroup D & Rothenberg R (1995). Public health surveillance for chronic conditions: a scientific basis for decisions. *Statistics in Medicine* 14: 629-641.

World Health Organization (2002). *The World Health Report 2002: Reducing Risks, Promoting Healthy Life*. Geneva: World Health Organization.

## Acknowledgements

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## Further developments and updates

Subject to agreement and funding, a number of developments could be undertaken:

- Details of hospitalisations potentially avoidable through ambulatory care interventions are currently being prepared and will be forwarded to Divisions (and posted on the PHIDU web site) when they are available. Other enhancements will be considered as appropriate datasets become available.

The profiles could be updated as the data are updated. For example:

- Population estimates, avoidable hospitalisations, immunisation, and GP activity and workforce data – annually;
- Chronic disease estimates – three-yearly;
- Census data – five-yearly.

Any developments would be informed by consultation, including with Divisions.

## PHIDU contact details

**For general comments, data issues or enquiries re information on the web site, please contact PHIDU:**

Phone: 08-8303 6236 or e-mail: [PHIDU@publichealth.gov.au](mailto:PHIDU@publichealth.gov.au)